



Réunion CALICE France

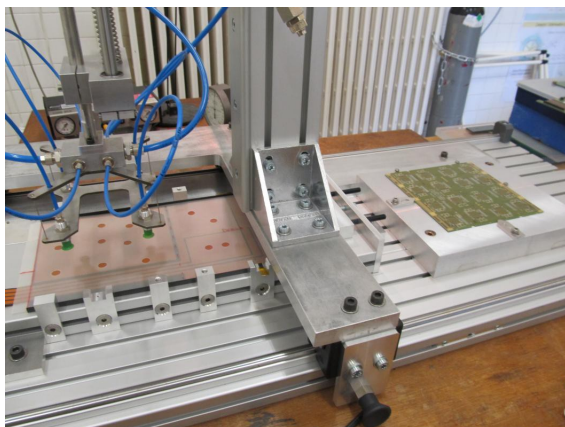
Resumé LAL Orsay



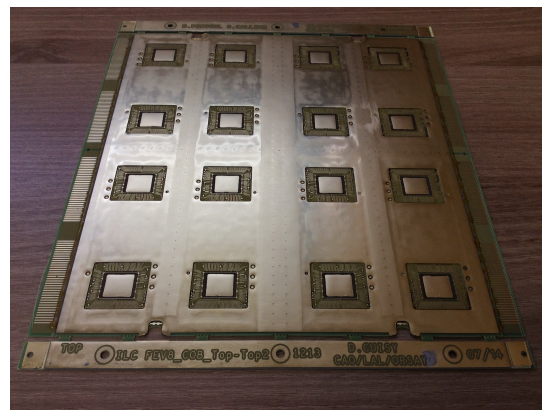
Date 16/10/17

Realisations and results

- Assembly of short Ecal slabs
 - Travaux de pointe!

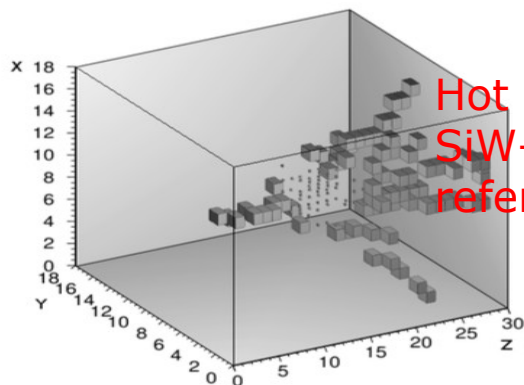


- Studies of ultra-thin PCB
 - Solution for an ultra-compact calorimeter
 - Support by FKPPL and Campus France (New production ongoing, tests 2017/18)

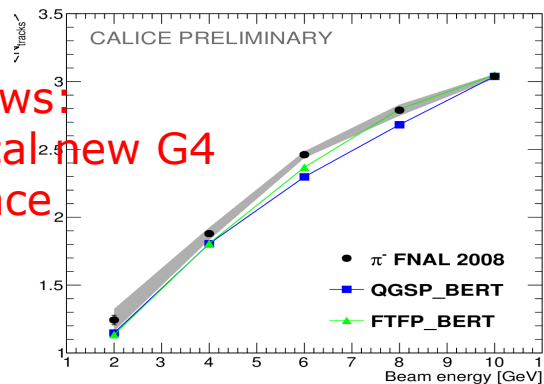


Beam test analysis

- NIM A 794 (2015) 240
- CALICE Analysis Note CAN-055 (Thesis S. Bilokin)

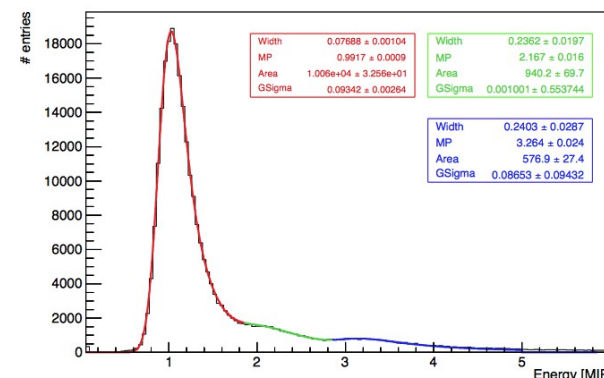


Hot News!
SiW-Ecal new G4
reference



Beam Tests 2017 (A. Irles)

Single cell energy distribution for 3 GeV e⁺ beam w/o absorber



Technological prototype Si-W Ecal

Local scientific responsible: Roman Pöschl
Local technical responsible: Roman Pöschl

Description :

Assembly of layers of a highly granular electromagnetic calorimeter, studies of ultra-compact readout electronics and analysis of beam test data (Publications see backup)

Participating researchers:

• R.P., Dirk Zerwas, A. Irles

Current list of participating ITA:

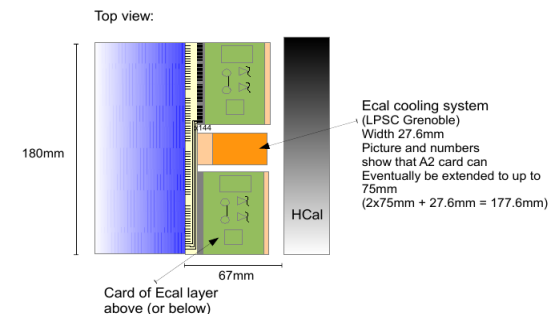
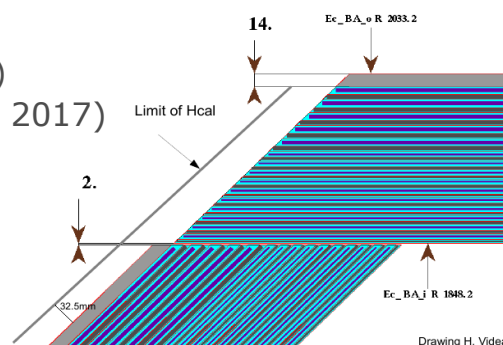
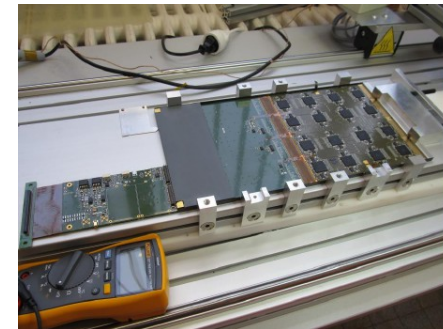
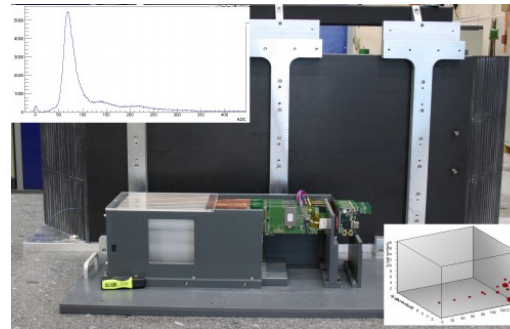
• 9 permanents

- Julien Bonis, IE (SDTM)
- Alice Thiebault, IE (SDTM)
- Alexandre Gallas, IE (SDTM)
- Jihane Maalmi, IR (SERDI since 2017)
- Dominique Breton, IPP1 (SERDI, since 2017)
- Jimmy Jeglot, IE (SERDI, since 2017)
- Pascal Rusquart, AI (SERDI)
- Christophe De Andrade, AI (SERDI)
- Marco Fernandez, T, (SERDI)

• 0 CDD:

• 0 Doctorants:

- International collaboration within CALICE, ILD
- French groups: OMEGA, LLR, LPNHE, LPSC
- Deliverables in AIDA-2020 and P2IO-HIGHTEC



Ecal cooling system (LPSC Grenoble)
Width 27.6mm
Picture and numbers show that A2 card can eventually be extended to up to 75mm (2x75mm + 27.6mm = 177.6mm)

Anticipated Evolution (~3 years)

- **Staff**

- New PhD student (immediate need)
- Getting joined by researchers of other projects

- **Activities**

- Preliminary conclusions on physics potential of heavy quark physics at LC
- New studies according to « needs »
- Continuous analysis of beam test data
- Production of a long slab of Ecal and revision of digital readout
- Contribution to proposal of Si-W Ecal for a LC detector
- Extension of ILD Integration activities

- **Requests 2018**

- Material for slab assembly (at least one mechanical model and a 'real' slab)
 - => ~20 PCB, several Kapton HV and interconnection material (10 kEUR)
 - => Study for industrialisation of assembly (10 kEUR)
- Electronic cards for digital readout (10 kEUR)
- Total AP : 30 kEUR
- Missions : 55 kEUR (see project file)

BACKUP

[+ Tous les documents jugés utiles pour la discussion]

ILC Group at LAL

Responsible
Roman Pöschl

Physics studies

D. Zerwas, F. Richard
E. Kou, F. LeDiberder,
S. Bilokin, R.P., A. Irls

Formation:

5 theses since 2006
~15 internships since 2006

Detector R&D

Tests Ecal : R.P., D. Zerwas,
Adrian Irls

Digital Electronics :
Dominique Breton (SERDI)
Jihane Maalmi (SERDI)
Jimmy Jeglot (SERDI)

Integration Ecal:
J. Bonis (SDTM),
A. Thiebault (SDTM)

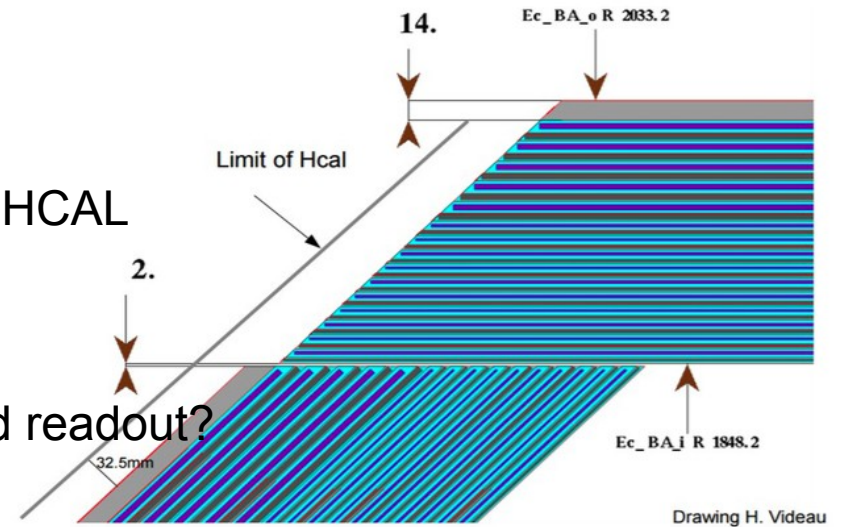
Integration ILD:
C. Bourgeois (SDTM),
A. Gonnin (SDTM)
B. Mercier (SDTM)
C. Prevost (SDTM)

Algorithms and beam Test analysis

S. Bilokin, R.P.
B Kegl

Basic space and functionality requirements

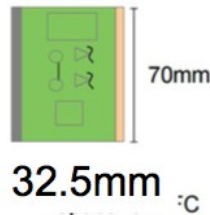
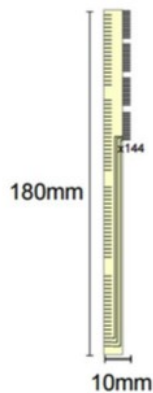
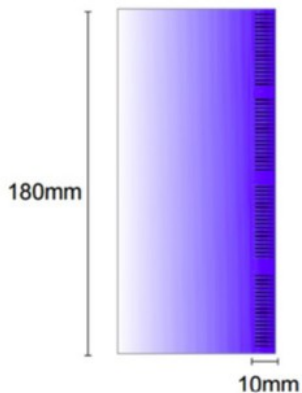
- Oriented on needs of LC Detector (ILD)
- r/o electronics in gap between LC Ecal and HCAL
- Paris Metro Ticket to readout 10000 cells
- Design question: Separation of detector and readout?



Last ASU of Ecal layer

Adapter card 1:
180mm -> 70 mm

Adapter card 2:
Carrying services as
Power regulators, switch,
capacitance (0.1 – 1 mF) and FPGA,
Flat Flexible Cable for connection to Hub2



Examples:

- ASU + Adapter1 + Adapter2
- ASU+Adapter12
- Special ASU integrating first level of digital r/o

New activity that recently started with technical support by SERDI of LAL

Compact readout system is deliverable in AIDA-2020 and HIGHTEC at beginning of 2019

Technical projects II

ILD Integration

Local scientific responsible: Roman Pöschl

Local technical responsible: Christian Bourgeois

Description :

Maintenance of ILD CAD Model, coordination of ILD detector integration (R.P.) and vacuum studies

Participating researchers:

- R.Pöschl

List of participating ITA:

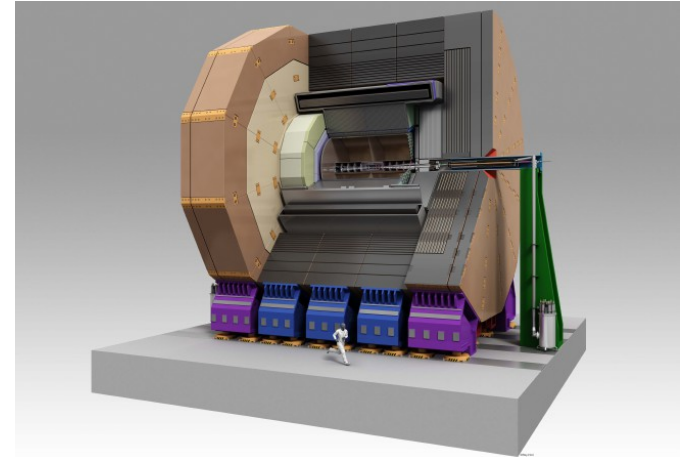
• 4 permanents

- Christian Bourgeois, IR, SDTM
- Alexandre Gonnin, AI, SDTM
- Bruno Mercier, ?, SDTM
- Christophe Prevost, ?, SDTM

• 0 CDD

• 0 Doctorants

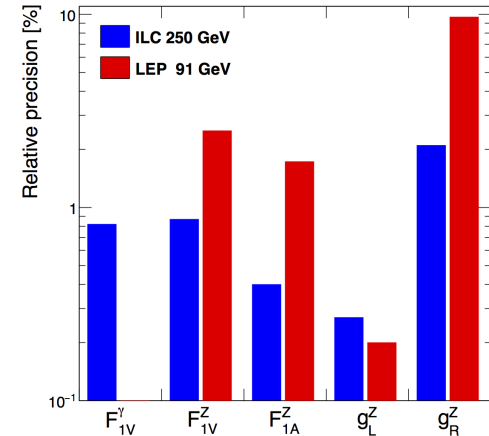
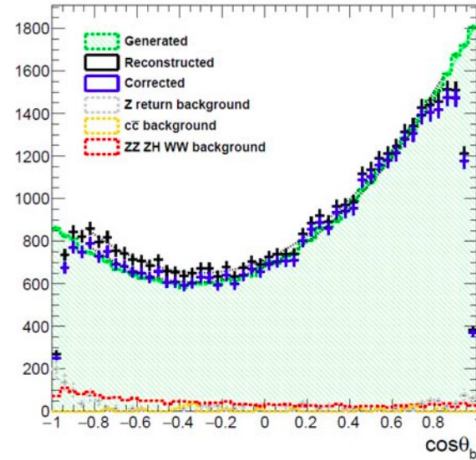
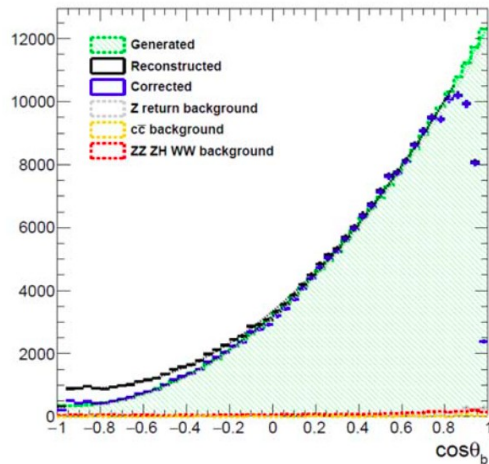
- ILD is most advanced option for ILC detectors
- Most of French groups involved
- Integration is essentially driven by LAL, LLR (Henri Videau) and DESY



Scientific results I

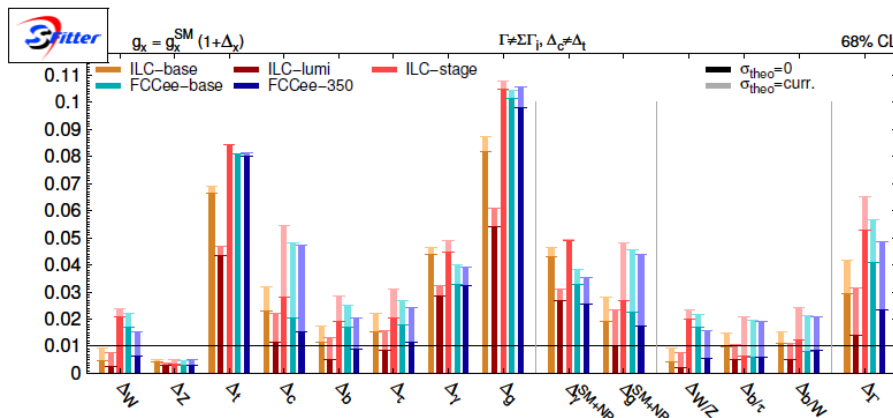
Simulation studies and beam test analyses

- e+e- q bb (250 GeV), b charge measurement and electroweak b-couplings (Thesis S. Bilokin) and arxiv:1709.04289



- Higgs couplings and radion production
- Eur.Phys.Lett. 101 (2013) 51001, update 1706.02174

arxiv:1702.03984



Scalar Production in Association with a Z Boson at LHC and ILC: the Mixed Higgs-Radion Case of Warped Models

Andrei Angelescu^{a *}, Grégory Moreau^{a †}, François Richard^{b ‡}

Scientific results II

Top quark studies, electroweak couplings at 500 GeV

- cf. LAL/IFIC EPJC (2015) 75:512

arxiv:1503.04247

LAL/IFIC/DESY/HU

arxiv:1704.00540 (submitted to EPJC)

